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SCHOOL AND SOCIETY

Volume XVII SATURDAY, MARCH 31, 1923 Number 431

THE STABILIZING FACTOR IN EDUCATION[1]

A STUDY of the conditions of the world will convince the casual observer that our moral and social development has not kept pace with our technical skill. Our knowledge of ways in which to kill our fellowmen is far in excess of the opposing, inhibiting passion of brotherly love. Likewise our social ideals are by no means as far advanced as our mastery of the economic factors used in the acquisition of wealth. The desire for knowledge and the acquisition of wealth are individualistic. These particular fields of human endeavor are largely dominated by the ambitions of the individual, and, as a result, are subject to rapid changes, while society, as a whole, develops much more slowly because so few people can spare the time from their individualistic pursuits or have the inclination to think of the problems of society as a unit. We are not yet agreed that the welfare of society depends upon taking thought. We have had numerous systems proposed from time to time for the amelioration of our social ills with the results which are known to all.

1. There are those who would remedy all the ills of society by means of benevolent sets of laws calculated to anticipate any original ideas that may be proposed from time to time and to safeguard properly their extension by expedient legislation or an all-encompassing constitution. These legal barriers are to serve as signposts and call attention to the vast number of side-paths which are forbidden. If you stay in the path bounded by the signposts, you will get through the world with small difficulty and no particular distinction. Nearly every one has a signpost that he would like to have erected along this path calling attention to the particular reform which, to him, is the active saving principle for all social ills. If anything is wrong, these reformers and guardians of the public weal would immediately change the existing laws to narrow the lane through which civilizations must pass and thus provide the cure.

We must all agree that there is much good to be obtained from a simplification of cumbersome organization, but nothing of fundamental import can come, or has come, from this method since its paternalistic trend eliminates thoughtful initiative on the part of the great mass of followers. The plan is antagonistic to the development of the type of individual which is necessary if democracy is our ideal. We can not dispense with the rules of the game, but neither can we hope for the highest in civilization through changes in the rules of the game.

2. There are some who believe that the solution lies in the equitable distribution of the sources of wealth. This may be highly desirable, but it is a result and not a cause and will come as a by-product of the liberation of intelligence.

3. There is another group who, despairing of the results of legislative reform, have believed and hoped that the doctrine of the brotherhood of man would, in time, so impress itself on the consciousness of

[1]Presented before the Department of Superintendents, National Education Association, Cleveland, Ohio, February 27, 1923.

mankind that our inherited manifestations of human or simian nature would undergo such changes as would offer a basis for a hope of consistent and eternal advancement in the human race. There have been some rather significant advances in this direction, as teaching as a function of the church has supplanted exhortation as emanating from the inspiration of a tribal god. There is certainly something to be hoped for in this direction as the church appeals to the thinking power of man to eliminate suspicion and hate, which apparently are elements quite as common to our natures as brotherly love.

4. This leaves for our consideration but one other method—that of education—and this apparently has been lacking in many respects. The results which we have had from education have been disappointing. Still, education has many points of vantage over other methods. It reaches, or can be made to reach, all of the people of the world. It can, in time, eliminate the domination of the tribal gods. It may eliminate fear. It has within itself the means of reaching all of the people, even though they are not within the walls of some school building. It is the most powerful advertising medium in all the world. Nearly every family in this country can be reached in a few hours through the agency of the schools.

"What you wish to see appear in the life of a nation must first be introduced into the schools," said Von Humboldt, and there probably has been no truer thought expressed with reference to education. It also calls to our attention, for reflection at least, the converse thought that the things which are taught in the schools will inevitably appear in the life of the nation and to a very large extent will determine the direction in which that nation is moving.

Why is it that so many civilizations have developed on the face of the earth, flourished for a time, and then have gone into decay? Why is it that many civilizations have perished from the earth, leaving but a vestige of authentic material to attest to their existence? Why is it that many civilizations are not even memories, while others are remembered most because of the debaucheries which just preceded their removal from active participation as factors of the world's progress? In the cases of many of the civilizations of former times, there are people still living on the site prominently occupied by their ancestors of a few centuries before. The decadent force has been dwindling through the years that have elapsed since the days of their original power and glory. What has happened to these people? Must all civilizations go in this way? Must our country be no exception to the common fate of nations? What are the factors that have enabled some nations to maintain their integrity for centuries while others have declined after a few generations of leadership and prominence?

Where civilizations have deteriorated from internal causes, it has seemed that there developed, in most cases, a very high degree of intellectuality on the part of a limited number of the inhabitants, often not the most influential. Finally the gap between these intellectuals and the mass below became so great that they revolted and the total mass was leveled by removing the top. Later, much later, another civilization might extend a peak of intellectuality above the mass, only to have the leveling process repeated.

The history of these cases makes us ponder and take stock of our intellectual base to see whether there are certain fundamentals which have been neglected by our ancestors of the past and whether there is something which they failed to appreciate, and which we can put into our system of

training to insure for us a fate slightly better than the fate of those who have preceded us.

Why is it that the progress that has been made in the development of science is so much greater than that made in any other direction? It has not been many centuries since those who dared to bring forth any ideals which were not in accord with the established order of things were branded as traitors. The men who dared to investigate the secrets of nature sacrificed their social standing and sometimes their lives for their temerity.

At the beginning of the seventeenth century, Francis Bacon led a movement that was destined to free the world from part of its bondage. He is one of the greatest men of all time. To-day we eagerly accept his philosophy. The development in this field of knowledge has surpassed all the dreams of success that Bacon may have had for it.

The world has accepted the scientific viewpoint as regards science. We carry little shelf-worn material in our stock of scientific knowledge. There the truth is predominant, and the world does not hesitate a moment to accept a new truth that makes the one of yesterday, which it supplants, valueless.

This is not so true of religion, politics, social science and the philosophy of education. We have changed rather slowly in these fields, probably because the ultimate truths in these fields are not so easily demonstrable as in the field of science and our conservative tendencies oppose a change which can not be proved expedient and desirable. Our residual prehistoric natures stiffen and balk at most attempts to change our century-old inherited ideas concerning these things. When a nation can be so much interested as we have just been in the ritualistic twaddle of the "day by day in every way" we can be sure that there is still much superstition to be eradicated before the thinking process in all fields shall reach the high plane now held by thinking in the field of science. When a great state can suggest that teachers shall lose their rights to teach if they discuss, or presumably think of, any changes to the existing forms of our governmental machinery, it is time to wonder whether there is a chance for the liberation of the minds we so diligently seek to cultivate. However, let us hope. Let us hope for a leader—a superman—a Francis Bacon who will arise to lead the world in the field of general education.

It is always a disagreeable experience to find that one is beginning to doubt. We are quite prone to revel in the belief that we are strong in our opinions and thoroughly fortified in unassailable positions based on logical deductions. To be in doubt is to be quite ill at ease. As soon as we begin to doubt or even question the things we do, we become so involved in our destructive philosophy that we are likely to give up in despair and decide that the world is getting along pretty well as it is. Why worry? Yet the great advances in human betterment have come because some one raised a question and dared to hope for an answer.

When we are inclined to become pessimistic in thinking over this problem and despair of the results the individual may produce, it may be well to recall the remarkable influence of Arnold at Rugby. His was a school of comparatively few pupils, yet the influence of that school has extended throughout England and the world. He was a leader with a definite purpose and with remarkable power. His leadership was multiplied immeasurably through those who came under his influence.

All people are interested in education as it applies to their particular field of endeavor. The great leaders in all fields of activity find that the universal theme for

all time is education in one form or another. The philosophy of education, whether called by that term or not, is the topic which is discussed every day by thousands of people. Occasionally there comes from this diffused discussion something which commends itself to our attention. To-day the attitude on the part of the educators is one of welcome to all the educational theories that may be offered. However, we must depend upon the professional rather than the non-professional critic of education to furnish plans for the advancement of education and the testing of such theories as may, from time to time, be advanced. We must have confidence in the results that prove worthy and courage in extending them in our work.

Many school administrators are so busy with details that actually they have no time to think about education. They do not have time to test plans and conduct experiments. Of necessity they "muddle through." They don't believe anything "very hard," and, as a result, they are willing to permit their mild opinions to be "denatured" to fit in with those of the many non-professional critics who are to be found everywhere. The world will get out of the way for the man with a worth-while purpose who acts to accomplish it, but it will not respect the opinions of a man concerning his own profession unless those opinions show and compel confidence.

The world is hungering for educational leadership that will discover the simple formula for developing the character and creative thinking capacity in her people which may serve as the antitoxin to the ills of the times. Character and the thinking process are essential and they must be the first aims of the education of the upper grades of school work. The subject matter may well be considered the valuable first by-product. It we are to attain to these results, we must first center our attention so that it may not be distracted from these essentials of education. It may be that science has developed so much faster than the rest of our knowledge that we are permitting it to distract our minds from the more fundamental processes. It is a rapid-fire age. We are so anxious to escape from the accusation of dullness that we permit our minds to skip along over so many things that rarely are there enough facts bearing on one subject to furnish the basis for a thought, as they say the dogs along the Nile drink as they run to escape the crocodile. We skim through the papers to get the current news, most of which will be valueless tomorrow; we listen to a speech at luncheon; scan some more news; listen in on several other types of broadcasting, and possibly finish the day with a visit to the movies. Our schools are affected, of course, in the same way, since they are a cross section of our life.

We are permitting entirely too wide an election of courses in our high schools and colleges. The facts that are acquired in these years certainly are not the most important elements of school life. This does not mean that they should not have the most worth-while information during their period. The most careful selection of material should be made since these facts are to form the basis of the thinking which is to be made the most essential factor in the work. The diffusion which we have had at times in these years leads to a futile dissipation of thought and instability of character.

We must be on the alert to ward off the full-floating type of reformer who would have the schools take over the pet activity that he has been nurturing for the years until he now thinks it should be able to subsist perfectly on public funds. We must develop a protecting shell against the propagandist who comes in all sorts of guises—sometimes as the savior of humanity.

sometimes as the ward boss, and sometimes as a brother own. As President Hopkins says, "just now we need a blue sky law for propagandists."

"Sloganizing" seems to be a popular pastime just now. Possibly it is not just a present tendency. It may have existed for ages. We elect a president by appealing to the sentiments of the people through the emotion expressed by "the full dinner pail." We elect a mayor on "five-cent fares." We "buy a Ford and spend the difference." We Coueize ourselves into an idea that the thing will happen if we can get enough people fingering the knots and chanting the ritual to the extent that thoughts are driven to the periphery of mundane occurrences.

The slogans have been effective in producing some excellent results and possibly we should condone the means because of the ends attained and use more of them in education. One thing is sure, however—thinking does not develop through any such means. Some individual has an idea; the rest are caught by a phrase. The five-cent fare idea becomes so strong that such questions as "What does the candidate think about the social conditions of the city?" or "What kind of a man is he?" have little bearing on the campaign. The slogan is an appeal to the mob. It is often quite difficult to keep the schools free from the influence of those who would have the children "drink a bottle of milk a day" or write essays on the "South Park addition," so that they may have time to think about some of the things for which the taxpayers' money should be used.

There are those who preach a philosophy which seems to resolve itself into the doctrine that we should train ourselves to get through the world as easily as possible and keep our skirts clean. Such a philosophy does not train for positiveness of character, but just the opposite. It does train you to get along with your neighbor. Maintain your self-respect—if possible—but get along with him. Some people will say that you lived a good life. Whether you have added anything to the sum total of things that go to make up progress will be quite another matter.

Fear of every sort must be eliminated if the educators are to lead the world in the liberation of intelligence. Fear is the foe of that confidence which is essential to real leadership. Fear springs from the consciousness of one's own inferiority and weaknesses and paralyzes mental and physical activity of a constructive nature. A few years ago I heard the superintendent of a large city school system say that the first essential of a superintendent's work was to hold his job. Of course, in a sense, that is important, but education will not develop very rapidly on that sort of philosophy. We shall not be acclaimed the leaders we hope to be until fear is banished; fear of the loss of a position; fear which results in the avoidance of positive stands on the questions which involve the work of education. Fear sets up in the imaginations of all of us many monsters which prove to be quite harmless if met with courageous sincerity.

There is another philosophy of education which stresses the intellectual side to the extent that we may develop enormously in science, in the arts, in government and in a knowledge of the culture of the ages. In times past, this philosophy has occasionally developed an aristocracy of intellectuality which has been of small value because of its very aloofness. It lacks a social understanding.

Between these two extremes there must be some middle ground for the practice of education that is sound, theoretically and practically, and one that will insure us a lasting civilization of a character which will furnish a maximum of opportunity for the expression of the powers and capacities of the social mass and offer the same opportunity to the individual.

Education, as we have been trained to

view it, apparently is no guarantee of character or of independence in thinking and acting. It is possible to get quite satisfactory advice and some degree of expert workmanship on your automobile if it is in need of repair. If, however, something is wrong with our governmental machinery, if the League of Nations needs a diagnosis of its defects and expert advice from statesmen, it is quite difficult to get an opinion free from the prejudices of the traditions of a century ago, free from the partisanship which is interested in the spoils of its prerogatives rather than the welfare of the nations of the world.

At the present time, we have more available knowledge, more ingenuity, and far greater material resources with which to work to build a world far greater in all the aspects that make for permanent greatness than any preceding age has ever had. What are the elements that, acting with these already mentioned, would serve to bind them all together and produce a world fairer and better for human habitation? Is it change of attitude that must come about? And if so, what is to bring about this desirable situation? Are we stressing in school work the things which are fundamental in all of our human relationships or are we dealing with things—material things—that represent but one side of the parallelogram of forces that if perfectly balanced would give to us continuous stability?

The solution to the problem seems to lie in leadership—a Moses with strength of character enough and vision enough to impress the world with his sincerity and ability. We shall probably have neither a "dark ages" nor a renaissance, but a gradual awakening to the responsibilities at hand.

This leader must do for education as a whole what Bacon did for the realm of science. We are educating for character as the stabilizing factor in education and creative thinking power as the force which will maintain it. We can not succeed if we are to remove, or better, if we are to continue to omit from our educational curriculum everything which is in the slightest degree controversial. The textbooks which we now use are censored by political, social and religious factions. Recently a textbook proposed for use in Ohio had to be changed because the author had ventured to suggest an opinion regarding Woodrow Wilson. Whether or not I agree with the opinion the author had expressed concerning Mr. Wilson, I should be glad to have my pupils have the opinion along with others and after a study of the record of Mr. Wilson's political life determine for themselves whether or not they believe it to be correct. The author is an individual and entitled to an opinion. The pupils are also entitled to opinions after sufficient study to warrant them. We can not develop character as fully as we should like unless we permit pupils to have material that has not been "dry kilned."

As Bacon suggests, we must cease "tumbling up and down in our own reason and conceits" and be willing to handle the materials of social and political science with the same freedom as we now handle the question of natural science. We must be willing to study them from the basis of the facts at hand and discard the prejudices of the past centuries.

The hope lies in intelligence, but it must be permitted to consider all the facts of our social fabric. Character, in sufficient quantities to stabilize the nation and the world, can not be developed if we are to say to the minds of our young men and women: "It is all right to think, but don't think about practical politics; don't think about religion; don't think about social problems, but stay within the paths that have been tried for centuries, concerning which there can be no more than an academic difference of opinion."

The education of my boy shall present for him some fundamental present problems. The fundamentals must be used as the working basis for independent creative thinking and the development of character as the first aim of the process of education. This is the stabilizing factor which must bind together all the auxiliary products of education if we are to achieve progress.

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MATHEMATICS THE PROJECT INSTRUMENT

THE purpose of this article is threefold. The first is to show some uses of mathematics as an instrument in carrying projects to successful conclusions. The second is to point out some values derived by mathematics from its applications in projects. The third is to consider the mathematics instruments in themselves; which are to be selected, how modified if necessary, and how developed to produce the greatest usefulness.

CONTRIBUTIONS OF MATHEMATICS TO PROJECTS

Mathematics is one of the most useful as well as one of the most used of the project instruments. It arises in all measurements. Kindergarten and primary construction work, such as making the simplest kind of a box, or a scrap-book, or a doll's house, all requires measurements. The more accurately the measurements have been made, that is, the more mathematically the work has been carried out, the better will be the result. Measurements are also necessary in a great number of the projects carried out in the intermediate and in the advanced grades. They are necessary in definite descriptions, as of a house. To say that a house is large or small gives no definite conception of its size; for this a statement of its length, width and height is needed.

Many projects require quantitative comparisons throughout, while others require the final result to be expressed as a definite quantity. Some teachers, to be sure, may express such results in the loose way of a qualitative statement in place of in the definite quantitative statement. But such qualitative statements lack force and power of conviction. For instance, a number of years ago a teacher in a rural school in Illinois had a class working on the fertility of seeds. He asked the class to bring to school samples of their fathers' seed corn to test. Some of the children brought the samples while others brought word from their fathers that they did not need the teacher's help in selecting their seed corn. In due course of time the samples were tested and some were found to be very low in fertility. The teacher might have told John, who brought corn that tested only thirty fertile kernels out of fifty planted, to inform his father that he had very poor seed corn and that it should not be planted. That would, however, have been too indefinite. What the children actually did was to compute what percentage of the corn was fertile and then to find how much this was below a good average of 95 per cent. John brought the further information that his father had raised corn on 120 acres the previous year which yielded 32 bushels per acre. From this data the children computed how many bushels were lost the previous year if corn only 60 per cent. fertile was planted instead of corn 95 per cent. fertile; how much it would have cost additionally to have harvested and marketed these extra bushels, as that would have been the only added expense; and finally, how much John's father lost in money. Note that the quantitative statements give real force to the findings of the project which they would lack without the mathematical computations. It should be added that, during the three years these projects were carried

on, the corn productivity of the district surrounding this particular school was raised about 20 per cent. above that of the farms adjoining.

The superintendent of a three-room village school asked his board to excavate under the school building and install a furnace. No argument which he could produce would move his board to burden the taxpayers of the district with this *big millstone* of expense. No, indeed. But Mr. Superintendent was not daunted, however. He immediately started his advanced class upon the project of finding out definitely the true weight of this dreaded millstone. The class first made the necessary measurements for the excavations and for the foundations from which they computed, according to prices furnished by local contractors, the cost of properly preparing the basement. They next secured estimates of the cost of a furnace and its installation from the local furnace dealers, together with their allowance for the stoves which would be discarded. This made the budget of expense. The class now secured an estimate of the cost of the fuel necessary to heat the school house with the furnace, which they found to be less than the estimate for heating it with the stoves, and from this the yearly saving in fuel. At the county treasurer's office they obtained the amount of the assessed value of the property in their school district. From these last data and the total cost of installation of the furnace they computed the added rate of taxation, together with what would be the additional tax on a property valued at $5,000, necessary to pay for the furnace in one year. With these definite statements as to the added expense the superintendent had no difficulty in securing the board's approval to install a furnace. It would have been enlightening to have computed further the net cost per year if the furnace had been paid for in ten yearly installments.

Financiers tell us that many men fail in business because of indefiniteness or carelessness in their business methods. It is often the case that a man financially embarrassed when called upon by his creditors is found to lack a definite knowledge of his finances. A number of years ago the writer was employed by a contractor, one of the duties being to make the estimates upon new work. Out of six or seven competitors there was but one upon whose figures he could rely. The writer's estimates were compiled carefully from the plans and specifications as were undoubtedly those from the one dependable competitor. Since definiteness is such a vital essential in successful business, it will be well for us to lead our pupils to look at the many questions that arise in projects and elsewhere from the quantitative standpoint.

The need of thrift among our people is recognized as one of the great national problems of to-day. It is also recognized as fully that thrift must be learned in the early years, and hence should be given an important place in school life. The thrift project, which has a mathematical background, can be made an excellent aid. In the advanced grades of our training school, which has since become our junior high school, we have used a practice bank. This led to the organization of a school savings bank. The value of mathematics in carrying on this project need merely be mentioned. It may not be out of place to say, however, that one of the things which made our savings bank a success was the fact that we made it very easy for a child to put money into the bank but extremely difficult for him to draw it out.

A number of years ago, before the writer had heard of the term problem-project, he carried out a project on chalk that may be of interest to teachers and school boards. We were using a very chalky chalk which turned the mathematics room into a regular dust emporium.

The writer sent for samples of harder chalk which was much better for the pupils to use but could not convince the superintendent that this chalk should be provided for the school. It cost a little more per box. The statement that it would last longer per box carried no weight. One Monday morning we opened a new box of the regular chalk and made a careful record of the time it lasted. A box of the hard chalk was next put into use and as careful a record made of the time this lasted. The amount of board work done during these two periods of trial was made as nearly the same as possible. The weekly expense of each kind of chalk was now computed from the data of the experiments. When it was found that the harder chalk was considerably more economical the superintendent called the attention of the board to the fact that we had investigated the values of the two kinds of chalk and that the harder chalk was not only the better but also the more economical. In the present day the matter would have been turned over to the class as a project.

If the matter of an election comes up in a project arising in the study of history or civics, it should be given definiteness by some numerical applications. For instance, in an election Mr. White received 1,467 votes, Mr. Brown 814 votes and Mr. Black 639 votes. Which candidate won? Did he receive more than a majority? If so, how many? What was the successful candidate's plurality over each of the other candidates? Such illustrations give definite tangible results which may be likened to clinching a nail after it has been driven through a board.

CONTRIBUTIONS OF PROJECTS TO MATHEMATICS

Let us now turn to the matter of the benefits derived by mathematics through its application in the problem-project.

It is a simple matter to formulate a long list of such exercises as, "Find the area of a rectangle 4 ft. by 7 ft." or "Find the area of a rectangle 5 yd. by 9 yd." Time and thought on the part of the problem maker will produce related motivated exercises which are not only enjoyed by the pupils but are much more beneficial to them. It should be in the project, however, where the children will meet the larger situations containing several elements. It is here that the children should meet real applications. Contrast the above two illustrations with the following which arose in a project worked out by a third grade class. In the course of this project it became necessary for the children to make seed boxes from paper by cutting and folding, each box to contain 4 cubic inches. Four differently shaped boxes were constructed. The amount of paper needed in the construction of each kind of box was now measured carefully and its area computed from the measurements. It was found that one box required as much as 81 square inches, while one required only 16 square inches. Here we have real measurements and from these the computations of areas, all of which play a definite part in the project; namely, finding which form of box can be made the more economically. Note how the project not only gives reality to the measurements and to the computations but also how the mathematics is used as a part of the project to show definitely which box is the more economical and how much more so than any of the others.

It should be mentioned in passing that this same idea may be carried out in the more advanced grades in manual training and in dressmaking where the economy of materials is to be taken into account.

Unless principles and operations studied in the mathematics classes are applied at other times, the pupils who can solve very difficult problems in the mathematics classes will be wholly at sea when con-

fronted with the simplest computations elsewhere. Applications of mathematics in the problem-project will give the pupils confidence and ability in using their mathematics outside of the mathematics class. This will help greatly to remove the just criticism upon our public schools that they do not equip their pupils with the ability to apply what is learned there. There is little wonder that the pupils can not apply their mathematics when the only practice given to them has been applications directly following a new principle studied. Projects furnish ample opportunities for just such varied applications.

Many teachers have devised projects, such as keeping store, for mathematical applications which give excellent practice and greatly motivate the work. But the true application, the application which is the real test, is the one in which mathematics is treated as an instrument in reaching definite conclusions in the projects arising in the various other studies and activities of the school. Opportunity for applications in such projects is ample indeed. A hasty review of the projects recorded in Part I of the *Twentieth Yearbook* showed that, of those listed, mathematics was required as follows: Kindergarten, 90 per cent.; primary grades, 75 per cent.; intermediate grades, 75 per cent.; junior high school, 80 per cent.; or, kindergarten through junior high school, 77 per cent.

It is this application of principles and of operations in the general situation, where the pupils do not have a principle or an operation stated in bold-faced type on the page just before them, which should be the main contribution of the project to the mathematics studied. Such applications enhance the value of mathematics in the eyes of the pupils as they see "what it is good for." It further brings up considerable review which is a positive necessity in good mathematics teaching.

We must clearly recognize that in the matter of application of mathematics, it will be impossible to produce the use of a principle in a project in exactly the way it will arise in after years. Nor is this at all necessary. The only thing necessary is that the pupils understand the principles and operations, and can apply them in a discriminatory manner. In the project of finding the more economical of the two kinds of chalk, the pupil should be led to see that the conditions under which the two kinds were used must have been as nearly identical as possible and that what was found was unit value; cost of chalk used during a week. This same principle can be applied as well to finding which is the more economical of two pairs of differently priced shoes, of two farm tractors, of two employees at different wages, and so on. Situations often arise in which the project application appears to bear no similarity to any later life application. John is doubtlessly little interested in finding what per cent. of its price flour has dropped, but he is greatly interested in computing his baseball fielding and batting averages. Still the same principle is used in both instances, finding what per cent. one number is that of another number.

THE MATHEMATICS INSTRUMENTS

In order to carry out this program of the application of mathematics in our projects we must recognize the necessity of teaching a mathematics that is serviceable to such applications and the teaching of it in such a manner as to make it applicable. It will, of course, be impossible to do more here than to make mere mention of these matters and to give an illustration or two.

May we not at the outset decide to teach our pupils the very best mathematical instruments which they are capable of using. Professor Maschke, late of the University of Chicago, used to say that

"Mathematics is learning how not to do a thing," by which he meant that mathematics was learning how to do a thing easily.

As an instance of serviceable mathematical instruments the various short cuts should be mentioned. When pupils can multiply readily by numbers of two digits and can divide as readily by numbers of one digit, they may be given the short cuts in multiplication and division by 5. When this has been thoroughly mastered through much practice they may be given a second short cut. These two short cuts must now both be used continually. When the second has become an integral part of the pupils' mathematical equipment, they may be given a third short cut, and so on. The big reason why mathematical short cuts are not in common use is that they are usually studied intensively for a short period of time and then completely neglected. To be of real service short cuts must be used continually. Then they will not only save time but will increase accuracy in computations because by their use simpler operations and simpler number combinations are employed. For instance, to multiply by 97 we merely annex two zeros, that is, multiply by 100, then multiply the given number by 3 and subtract. Note that multiplication by 100 is extremely simple and that multiplication by 3 is much simpler than multiplication by either 7 or 9.

It also behooves the mathematics teachers to be constantly alert for the actual processes used by men of business and of industry. For instance, children are too often taught in their mathematics classes to find the number of cubic inches in a piece of lumber and then to divide by 144 to obtain the number of board feet in the piece. Is it any wonder that the lumber men and the manual training teachers think our teaching pedantic? A 2" x 4" has 2 board feet in it for every 3 feet of length, so that a piece 12 feet long contains 8 board feet, and one 14 feet long contains 9⅓ board feet. Until recently it was customary for merchants to compute their gain per cent. upon the buying price of an article. At the present time the tendency is rather to find the gain per cent. of the selling price. Recognition of this condition should be taken in teaching profit and loss. It may be well for the teacher to ascertain the local usage.

Two illustrations must suffice on the improvement of teaching certain phases of the mathematics instruments. In arithmetic we should first of all discard the old tables of the addition and multiplication combinations. The only time that a table is used is when a child stands up and repeats it at the command of the teacher. He never uses tables in practice. In fact, these tables are actually a hindrance to rapid addition and multiplication. Who ever heard of teaching spelling by tables? But it would be just as sensible to teach spelling in the form of tables as the addition and the multiplication facts. A lady once asked if her daughter was taught the multiplication tables correctly by a tutor who used the form $1 \times 4 = 4$, $2 \times 4 = 8$, $3 \times 4 = 12$, in the place of $4 \times 1 = 4$, $4 \times 2 = 8$, $4 \times 3 = 12$, as the mother had learned them. It was suggested to the mother that she ask the tutor to teach each number combination as a separate fact. This plan was followed. After the girl had regained her health sufficiently to permit her to return to school, she had some difficulty in standing up to repeat the tables, but in her addition and multiplication work, that which really counted, she led the class.

The second illustration lies in the field of algebra. It is now generally conceded that the formula and the equation are the back-bone of elementary algebra. Several years ago the writer carried out an experiment in teaching one section of first year

algebra, in which a study of the formula and the equation was made the controlling motive. All other work was taken only as it was needed for a proper study of the formula and the equation. Fractions were brought into play to help solve equations and to express roots of equations. Radicals were studied after their need arose in solving such equations as

$$m^2 = 7.$$

At the end of the year this section had a command not only of the formula and the equation that was much superior to the section which followed the text in the regular way, but also of all the other topics as well. We have here the value of applications on a fairly large scale of a whole year's work in one subject.

CONCLUSIONS

In conclusion it may not be out of place to point out that the mathematics teachers must not be carried away with applications to such an extent that the necessary drills and practices in mathematical work are neglected. These applications may, to be sure, serve as the very best motives for drills and for practices. But with this application must come the drills and the practices or there will be nothing to apply when the occasion arises. A wood chopper who takes time out in the morning to properly sharpen his ax will soon make up this time when competing with men who work with dull axes. For the very best results mathematical study and its application in various branches of study and school activities must be so arranged that each will supplement the other.

THEODORE LINDQUIST
KANSAS STATE NORMAL SCHOOL

EDUCATIONAL EVENTS

EDUCATIONAL SURVEYS IN ARKANSAS

THE state legislature of Arkansas for 1923 recently adjourned without having taken any important action toward fulfilling the recommendations for the improvement of the University of Arkansas and the public schools made by educational experts following two surveys.

It will be recalled that the state legislature of 1921 passed an act providing for an educational survey of the state university by the United States Bureau of Education, and the bureau later accepted an invitation to make a survey also of the public school system of the state. The university survey commission reported favorably upon the faculty and work of the university and pointed out that it needed additional and improved buildings and equipment. Attention was called to the comparatively small number of students in the College of Agriculture. As to the agitation to remove the university from Fayetteville to Little Rock, the commission recommended that the people of the state make a decision by vote.

The action of the 1923 legislature was reported in a recent editorial in the *Fayetteville Democrat* as follows:

Identical bills were introduced into the senate and the house to refer the university movement issue to a vote of the people. Both of these were defeated, but the strenuous and long continued fighting over the removal and separation issues prevented the constructive recommendations of the commission for the upbuilding of the university from even being considered.

The Public School Survey Commission presented a report making numerous recommendations for the improvement of the public schools. Chief among them were greater centralization of control and removing the limit on taxation for schools. At a general election held a few weeks prior to the filing of the report, a constitutional amendment proposing to do these two things had been overwhelmingly voted down. The sentiment of the voters was evidently against that recommendation as well as others which were looked upon as radical. Nothing was done by the legislature for the relief of the public schools except the passage of a severance license tax on natural resources and a personal income tax of one tenth of one per cent. These taxes will, however, produce only a small part of the additional funds the schools need.

The *Fayetteville Democrat* summed up the situation in these words:

The failure of the two surveys to accomplish anything for the university and the public schools is easily accounted for. In the case of the university, it was the opening up of agitation for re-

moval and separation; while the failure of the commission on public schools to get the proper perspective of local conditions prevented its recommendations from being given any consideration whatever by the legislature.

THE NEW YORK BILL ON HISTORY TEXT-BOOKS

THE Teachers Union of New York is endeavoring to enlist the help of teachers of history in its efforts to prevent the adoption of a bill now in the hands of the Committee on Public Education of the Senate of the State of New York and has forwarded to the committee numerous opinions obtained in an informal referendum.

The bill, as quoted in a letter of the Teachers Union addressed to the teachers of history in the high schools of the city of New York and to teachers of history, education and sociology in the colleges within the state of New York, is as follows:

Section 680. Use of certain types of books prohibited. No text-book shall be used or designated for use in the schools of any city, union, free school district or common school district of the state which

(*a*) ignores, omits, discounts or in any manner belittles, ridicules, falsifies, distorts, questions, doubts or denies the events leading up to the declaration of American independence or connected with the American revolution, or the spirit and determination with which the United States of America has established, defended and maintained its rights as a free nation against foreign interference, encroachment and aggression, or

(*b*) ignores, omits, discounts or in any manner belittles, ridicules, falsifies, distorts, questions, doubts or denies the deeds and accomplishments of the noted American patriots, or questions the worthiness of their motives, or casts aspersions on their lives.

Section 681. Enforcement of the provisions of this article.

1. The commissioner of education shall supervise the enforcement of the provisions of this article and he shall withhold all public school moneys from any city or district which, in his judgment, wilfully omits and refuses to enforce the provisions of this article, after due notice, so often and so long as such wilful omission and refusal shall, in his judgment, continue.

THE PROPORTION OF TEACHERS AND STUDENTS AT THE UNIVERSITY OF WISCONSIN

CONCERNING matters relating to the University of Wisconsin contained in the recent message of Governor J. J. Blaine, Dr. E. A. Birge, president of the university, made the following report to the board of regents at its recent meeting:

The table of statistics on which the governor based his statements contains serious errors. I called his attention to some of these mistakes immediately on the appearance of the message and the governor included in the message which he sent to the Senate yesterday corrections in the number of "regular year students." The effect of these corrections is to show that the faculty has not increased more rapidly than the number of students in the decade 1911-21. On the contrary, *the number of students has increased more rapidly than that of the faculty*, even on the statistics as shown in the table.

There are other important corrections to be made in the table with reference to the number of the faculty. The term "faculty" is by no means equivalent to the term "teaching force." A very large number of the faculty is engaged in duties relating to extension, to agricultural experiment station, and similar duties performed for the benefit of the public but which have no relation to the students at Madison. These persons should be subtracted from the faculty list before any comparison is made between the teaching force and the number of students at different periods.

The number of part-time teachers, like lecturers and assistants, has also increased rapidly in recent years. The effect of this change is that the list of names as contained in the catalog is very much greater than the actual full-time working force of the university, since a considerable share of these represent persons *who are employed only part time*. In order, therefore, to compare the teaching force at different periods with the number of students in attendance, the number of the faculty should be stated in terms of full-time teachers, and from the total thus obtained *there should be deducted those whose duties are for the public at large and not for the students on the campus.*

When these corrections have been made in the faculty estimates it will be found that the number of students has grown since 1911 very much faster than has the teaching force.

Governor Blaine, in his message on Tuesday, changed the year with which he compared 1921-22

from 1911-12 to 1901-02. By this change he extended the period of comparison to twenty years and carried the university back into a period when it was essentially different from its condition either in 1911 or 1921. The comparison between 1911 and 1921 is a perfectly fair one so far as general organization of the university is concerned; and if the data which the governor first used had been correct, they raised a question which ought to be answered. But there is no such ready comparison in any part of the school system of Wisconsin or of any other state in the Union between its condition to-day and that of twenty years ago.

The same remarks, however, which I have made regarding the numbers of the faculty apply with even greater force to the situation in 1921 as compared with that in 1901.

NEGRO UNIVERSITIES AND COLLEGES

THE advance in standards and enrollment within the past decade in negro universities and colleges is shown in a report just issued by the trustees of the John F. Slater Fund, written by W. T. B. Williams, who was author of a similar report in 1913. As Dr. J. H. Dillard points out in an introductory note, "Mr. Williams is a graduate of Harvard University, and as field director for the Slater Fund and the Jeanes Fund has had large experience in visiting and inspecting schools of all grades."

Thirty-three of the leading institutions offering advanced training to colored youth are considered in this report, a typical group located in eleven southern states, four northern states and the District of Columbia. They are supported by missionary societies, philanthropic bodies, churches and public funds.

Mr. Williams reports that the total number of college students in the 22 universities he studied in 1913 was 945; in the same institutions the college students in 1922 numbered 2,036, an increase of 115 per cent. He states further:

> In the 18 universities and 15 colleges covered by this study there are 3,264 college students. They constitute, however, only 21.9 per cent. of the total 14,905 non-professional students enrolled in these schools, or 20.4 per cent. of the whole enrollment. If the 3,264 students of college grade were distributed evenly among the 33 institutions, there would be 98 college students in each school. There is a growing tendency, however, for the college students to congregate in a comparatively few of the stronger institutions. Howard University, for instance, has 895 of these college students, or 27 per cent. of the whole number; and eight schools with the highest college enrollment have 2,205 of these students, or 67 per cent.
>
> There are enrolled in all these institutions 6,555 high school students. They form 43 per cent. of the non-professional students in this group of schools.
>
> In the elementary grades among these schools 4,486 students are enrolled. They constitute 30 per cent. of the non-professional enrollment in these thirty-three universities and colleges.
>
> The universities and colleges are beginning to feel the effect of the gradual improvement in the public elementary schools during the last ten years. Most of these schools have found it possible to reduce the number of their elementary grades. Eight of the universities and one college have dropped their elementary grades entirely.

Mr. Williams presents tables as to courses of study in high school departments, colleges and professional departments, and detailed tables as to enrollment, teaching staff, values of school plants, etc.

Under the heading administration and instruction, this information is given:

> Of the 33 presidents 18 are colored and 15 white. In the 22 universities reported upon in 1913 there were only 8 colored presidents. In this latter group there has been a gain of only two colored presidents; but by including in the present group the 15 colleges and several universities not formerly studied, the tendency toward colored officers and teachers is made clear. In the 33 schools there are 269 white teachers and 715 colored teachers, or more than two and a half times as many colored as white teachers, while nine years ago there were in 22 of the schools of this group only 59 more colored than white teachers. As to sex, these teachers are divided into 129 white men and 399 colored men, and 140 white women and 316 colored women.

In his closing paragraphs Mr. Williams says that it is "probable that the negro college and university will be called upon to serve a steadily increasing number of young colored men and women. For a number of reasons it is desirable that they take their college work mainly in the south." He says that strong courses with a considerable range of subjects should be offered. He believes that "if these

negro colleges and universities are to render the greatest possible service, it is necessary that a reasonable number of them be so strengthened financially and otherwise that they may become efficient institutions of genuine college grade."

THEOLOGICAL SCHOLARSHIPS AT HARVARD

AT the meetings of "visitation week" at the Harvard Theological School in April, there will be a discussion of ways to put into effective practice next year the recently adopted policy of awarding scholarships.

The new policy is, first, to reduce the number of scholarships and increase the amount of the stipends, so that they may become honorable academic prizes, to be awarded by scholarly competition in the open field; and, second, to appeal to the churches of greater Boston to enter into a cooperative arrangement whereby students in the school may do "compensated church work" during their first and second years, and for this work receive a stated stipend of from $500 to $600, thus earning their way by practical parish work under supervision.

This plan is described by Dean Willard L. Sperry, of the Theological School, as "a double system of scholarships and self-help which throws the burden of initiative and responsibility on the student." In a faculty letter sent to graduates of the Harvard Divinity School and the Andover Theological Seminary, which affiliated last spring to form the new Theological School, he states that hitherto it has been the custom of the Divinity School and of Andover Seminary to award scholarships of from $250 to $400 to any student who has an average grade of at least B. The bulk of the students in both schools have been in the past recipients of such scholarship help.

Theological schools have the reputation of distributing scholarships rather more freely and generously than any other graduate schools. This practice, says Dean Sperry, "has been criticized as the beginning of the pauperization of the ministry, and as at variance with the whole trend of the modern church, which is trying to set the ministry upon solid ground of economic independence and self-respect. It is further felt," he says, "that the more generous and indiscriminate the scholarship awards, the less resourceful and desirable the type of man who responds to such an appeal." By awarding fewer and larger scholarships, he says, the school proposes to make them "goals toward which all men in residence shall be working."

The new policy conforms largely to that of other Harvard professional schools and other leading theological seminaries of the country, and is described as aiming to do away at Harvard University with a general situation the existence of which was deplored by President Lowell in a recent annual report, in which he said: "The practice, which began about a century ago, of striving to secure students by giving them a free education is probably one of the principal reasons why, save in a few rich city parishes, the ministers of religion are grossly underpaid. Beginning their career as recipients of charity to a degree that other professional students are not, they are placed from the outset in an unfortunate position which results in a still more unfortunate attitude of the community toward them."

EDUCATIONAL NOTES AND NEWS

THE inaugural exercises for Dr. Cloyd Heck Marvin as president of the University of Arizona will take place on April 23 and 24.

THE fiftieth anniversary of the founding of the first permanent American department of education at the University of Iowa will be celebrated with a convocation on the afternoon of April 27 and the morning of April 28. Dr. Stephen Leacock, professor of economics at McGill University, will speak on "Education for democracy."

PROFESSOR EARL HUDELSON, who for the past three years has been a member of the department of education in West Virginia University, has been appointed professor of education in the University of Minnesota.

DR. E. J. JAQUA, now dean of Colorado College, has been elected dean of the faculty at Pomona College beginning on September 1. He succeeds Dr. Edwin C. Norton, a leader

in the college ever since its beginning thirty-five years ago, who resigned from the administrative portion of his work two years ago, but continues as professor of Greek.

ERIC W. ALLEN, dean of the school of journalism of the University of Oregon and lecturer at the summer sessions of the University of California, has been elected president of the Association of American Schools and Departments of Journalism for 1923.

DR. JOHN C. BLISS, for the past 15 years principal of the New Paltz, N. Y., State Normal School, has tendered his resignation to take effect at the close of the present school year. His retirement is due to continued ill health.

SUPERINTENDENT E. S. SELLE, of Mankato, Minnesota, has accepted an appointment to a teaching position in the Winona State Teachers College for next year.

DR. GUSTAVE A. FEINGOLD, who has been on the faculty of the Hartford Public High School since 1917 and director of intelligence tests since 1919, has been elected vice-principal at the same institution.

MR. L. A. RODES, principal of the Cape May, N. J., High School for several years, has been elected superintendent of public schools of Cape May.

DR. R. HEBER HOWE has resigned as director of rowing at Harvard to become headmaster of the new Belmont Hill School at Belmont, Massachusetts. For the past two years Dr. Howe has been a graduate research student at Harvard in the Bussey Institution. The new school is a country day school for boys. The advisory board includes Dean Henry W. Holmes of the Graduate School of Education at Harvard.

MR. CHARLES H. BREED, head of the Latin department of the Lawrenceville School, has been elected headmaster of the new Providence Country Day School for Boys at East Providence, R. I.

THE trustees of the Maine Wesleyan Seminary at Kent's Hill, Maine, announce the resignation of Mr. John Orville Newton as principal and the appointment of Mr. Thomas Webb Watkins to succeed him, at the close of the present school year. Mr. Newton has been connected with the school for 30 years, 16 years as a teacher and 14 years as principal. Mr. Watkins is at present assistant headmaster of the Huntington School for Boys in Boston.

MR. GEORGE F. DICKSON, sub-master of the Winchendon, Massachusetts, High School, has resigned to enter the United States Consular Service. He will leave at once for his station at Penang, Straits Settlement, Malay Peninsula.

MR. N. O. PITTENGER, a graduate of the University of Indiana, who has been in charge of the university book store and other business activities for 14 years, has been appointed comptroller of Swarthmore College, a newly-created office.

THE University of Chicago has announced the appointment to its faculties of Dr. Arthur H. Compton, head of the department of physics in Washington University, Professor W. F. G. Swann, of the department of physics in the University of Minnesota, and Dr. Emerson H. Swift, of the department of art in the University of Michigan.

DR. HELEN B. THOMPSON, dean of the division of home economics and professor of food economics and nutrition in the Kansas State Agricultural College, has been appointed professor of home economics in the University of California, Southern Branch, at Los Angeles.

ASSOCIATE PROFESSOR A. C. CONGER has been made acting head of the department of zoology and physiology at the Michigan Agricultural College to succeed Dr. Walter B. Barrows, who died in March.

DR. JOHN H. TANNER, professor of mathematics at Cornell University, has a leave of absence during this second semester, which he is spending on a trip to Europe and the Near East.

DR. AMOS S. HERSHEY, head of the political science department of Indiana University, Mrs. Hershey, and Miss Mary Orvis, of the Indiana University extension division at Indianapolis, are making an extended tour of Europe.

DR. IRA N. HOLLIS, president of Worcester Polytechnic Institute, is on a transcontinental

tour during which he will visit cities in Virginia, North Carolina, Kentucky, Alabama, Louisiana, Texas, New Mexico and California. The trip will culminate in the regional meeting at Los Angeles on April 16 of the American Society of Mechanical Engineers, of which Dr. Hollis is past president.

PHILIP W. L. COX, principal of the junior-senior Lincoln High School of the Teachers College, Columbia University; and Harry L. Moore, superintendent of schools and principal of high schools in New Hampshire, will give at the New Hampshire College Summer School two special one-week courses in education, from June 25 to July 3, and from July 5 to 11, respectively.

DR. CHARLES ABRAM ELLWOOD, professor of sociology, University of Missouri; Dr. Frederick E. Bolton, dean of the school of education, University of Washington; Dr. Robert R. Leonard, dean of the school of education, University of California; Knute K. Rockne, director of athletics at Notre Dame University; Mary Schenck Woolman, author and lecturer on home economics, and Dr. Cyrus D. Mead, assistant professor of education, University of California, will be members of the summer school faculty of the Brigham Young University, Provo, Utah.

PROFESSOR JAMES FLEMING HOSIC, associate professor of education in charge of extramural courses at Teachers College, Columbia University, will give two courses during the coming summer session at the University of California, one on "The project method as applied to junior and senior high school work" and a second on "Problems of supervision in the elementary school." Professor Hosic is secretary of the International Conference on Education which is being arranged by a committee of the National Education Association for the summer meeting at Oakland and San Francisco.

THE department of economic science of Teachers College, Columbia University, will give courses in the 1923 summer session on the "Economic problems of the household" including a general survey course on "Social and economic problems of the home," special courses on "Personal income management and thrift promotion," on "Housing and living conditions and community surveys" and research courses on housing and on living costs. The instructors include Professor Benjamin R. Andrews, of Teachers College, whose "Economics of the household—its administration and finance" has been announced by the Macmillan Company, Mr. Shelby M. Harrison, of the Russell Sage Foundation, and Miss Emma A. Winslow, who is this spring completing a research in England with Professor Bowley at the London School of Economics on living costs in England and in the United States.

THE resignation of Dr. José Antolin del Cueto, rector of Havana University, has been accepted by the Secretary of Public Instruction. Dr. Adolfo Aragon has been named as the new rector. For several months the students' federation has carried on a campaign against the rector and the faculty of the university. Strikes have been declared and public demonstrations staged by the students against the governing bodies.

PROFESSOR ALBERT EINSTEIN, of the University of Berlin, delivered three lectures in French at Madrid during the first week in March. The London *Times* writes: "The King presided at the sitting of the Academy of Science at which Professor Einstein was elected a member. The minister of education delivered a speech offering him, in the name of the Spanish nation, a new home should the troubles of his own country impede the tranquil continuation of his intellectual studies, and the rector of the Madrid University proposed that Dr. Einstein's wife, as well as himself, should receive the honor of having the diploma of doctor *honoris causa*.

DR. ERNEST H. LINDLEY, chancellor of the University of Kansas, will deliver the commencement address at the University of Iowa on June 5. His subject will be "The new pioneers."

DR. BIRD T. BALDWIN, director of the Iowa Child Welfare Research Station, will give a series of addresses at the Pennsylvania Schoolmen's Week, April 12, on the subject of the "Relation of mental and physical growth of children to school promotion." He will also address the International Kindergarten Union at Pittsburgh on April 19 on "Methods of measuring childhood."

DR. PAYSON SMITH, state commissioner of Massachusetts and president of the department of superintendence of the National Education Association, delivered an address at the annual meeting of the High School Masters' Club of Massachusetts in Boston on March 24.

PROFESSOR PAUL SHOREY, head of the department of Greek language and literature in the University of Chicago, is announced as one of the lecturers on the Guernsey Center Moore Foundation at Dartmouth College. The subject of his lecture, which will be given immediately after the commencement in June, will be "The influence of ancient thought on modern civilization." The other lecturer on the foundation is Professor Graham Wallas, of the University of London.

DR. CHARLES SWAIN THOMAS, of the *Atlantic Monthly Press* and lecturer on English at Harvard University, addressed a teachers' institute at Concord, Massachusetts, on March 16.

MISS GENEVIEVE FISHER, professor of teacher training at Margaret Morrison College, Carnegie Institute of Technology, gave an address on "Organization and content of evening school classes in home economics" at the annual convention of the Anthracite Arts Association, held recently at Bethlehem, Pennsylvania.

PROFESSOR GEORGE E. JOHNSON, of the Harvard Graduate School of Education, a specialist in problems of childhood, will be the instructor of the course "The child in pre-school years" which the division of university extension, Massachusetts Department of Education, is offering in Boston.

EDWARD WILLIAMS MORLEY, professor of chemistry at Western Reserve University from 1869 until his retirement as professor emeritus in 1906, one of the most eminent of American chemists, has died at eighty-five years of age.

DR. HILLARY ASBURY GOBIN, vice-president emeritus of Depauw University, died on March 18 in Indianapolis aged eighty-one years. Dr. Gobin, who was formerly president of Depauw, resigned recently and was given the honorary appointment of vice-president emeritus.

CLIFTON A. SMALL, principal of the Maplewood grammar school in Malden for a number of years and formerly superintendent of schools at Martha's Vineyard, died on March 19 at Randolph, N. H., aged fifty-eight years.

THE death is announced of Dr. Mason W. Taylor, associate professor of history in the University of Minnesota, at the age of thirty-eight years.

MR. HERSCHEL A. NORRIS, since 1899 principal of the Friends School, Wilmington, Delaware, died recently at the age of fifty-four. He was a graduate of Princeton University.

DR. MARGARET COLEMAN WAITES, head of the department of Latin language and literature, at Mount Holyoke, died on March 14 of pneumonia after a brief illness.

IT is proposed to erect at Elmira College a memorial on the campus in honor of Mark Twain. Mr. Clemens married Olivia Langdon, of Elmira, and lived many years at Quarry Farm on East Hill, Elmira, where his children were born. Here were written "Tom Sawyer," "Huckleberry Finn" and other books. On the death of Mr. Clemens his remains were taken to Elmira, where they rest beside those of his wife, his son, Langdon, and his two daughters, Jean and Olivia. The memorial proposed is from funds given without solicitation by his friends. The exact nature of it will depend on the final amount of the fund, which is not yet complete.

IN honor of the late Dr. Paul S. Reinsch, the faculty of the University of Wisconsin on March 5 voted the following minute commemorating his association with the university: "The faculty of the University of Wisconsin has been grieved to learn of the death of one of its most distinguished sons, Dr. Paul Samuel Reinsch, and, in the presence of this lamentable event, desires to record its appreciation of his varied activities while a member of this body, and of his later labors in many fields. Beginning in 1895 as an instructor, he was rapidly advanced to the professorship of political science. Working at first with American material he quickly advanced into regions where national interests passed into international problems, particularly those affecting Latin America and the Orient; and here his labors culminated in notable service as United States minister to China, and eventually as adviser to the Chinese government. Along this

course of swift advancement he left a series of books and monographs which bear testimony to the breadth and depth of his scholarship. The faculty deems it a matter of pride to make grateful acknowledgment of his achievements as a professor and as an active worker in the broader spheres of diplomacy and statesmanship, in which he served with honor to himself and his family, to his state and university, and to our country."

THE first number of *The American Student*, the issue for March, has just appeared. The editor and publisher is Mr. Robert L. Tennis, Buffalo, N. Y.

THE plans of the Greater Chicago English Club for this year include a Chicago authors' week in the high schools of the city, when there will be readings by Chicago authors.

THE College of Law at Cornell University has announced a summer course to begin on June 26. This is the first time for such a course. The Cornell summer school of law is not organized as a department of the summer session of the university.

THE Panhellenic Association of New York City is planning the erection of a clubhouse-hotel at an estimated cost of $1,000,000. It will be twelve stories high and contain 260 bedrooms. Three floors will be devoted to public meeting, club and dining rooms. The following national sororities have signified their approval of the plan: Kappa Kappa Gamma, Kappa Alpha Theta, Delta Delta Gamma, Alpha Omicron Pi and Pi Beta Phi.

BY the will of Frank Ferdinand of Brookline, Massachusetts, $2,000 is to be given annually from his residuary estate to the Farm and Trade School on Thompson's Island, to be continued "until such time within ten years from his death as the trustees shall deem wise," when they are authorized to pay to the school the sum of $50,000.

JUDGE MARTIN A. KNAPP, presiding justice of the United States circuit court of appeals, fourth district, who died in Washington recently, bequeathed $50,000 to Wesleyan University. Judge Knapp graduated from Wesleyan in 1868.

THE University of Maine has under way a campaign of $500,000 for a memorial gymnasium-armory.

THE campaign to raise a $1,000,000 endowment fund for the Episcopal Theological School at Cambridge, Massachusetts, has been completed, according to an announcement by Bishop William Lawrence, of Boston, who is national chairman of the campaign. Of the sum of $1,010,000 received, $408,000 is in cash and securities and the remainder in pledges of five years or less. In addition to this total, $39,000 was given before the campaign by five persons to meet the expenses of the drive, and part of this amount remains unexpended. A further amount of $34,000 has been written in bequests.

THE legislature of North Carolina, at its recent session, appropriated $1,600,000 for new buildings at the University of North Carolina and increased the maintenance fund approximately 50 per cent. This duplicated the action of the preceding legislature.

FRESHMEN and new students of Indiana University recently pledged $150,580 toward the student fund raised last spring at the university, when $400,000 was subscribed. This brings the total subscriptions of alumni, students and friends for the Indiana University Memorial Fund up to more than the million dollars originally fixed as the goal. Mr. William A. Alexander, librarian of the university, is executive secretary of the campaign.

WILLIAMS COLLEGE, from which he was graduated in 1871, eventually will benefit by approximately $140,000 under the will of James M. Ide, collar manufacturer of Troy, N. Y.

AT a recent congregation of the University of Cambridge, England, the bequest of Sara Norton, late of Boston, Massachusetts, of $5,000, was "gratefully received." The income is to be used as a prize for the best essay on the political history of the United States of America.

PRESIDENT MARY E. WOOLLEY, of Mount Holyoke College, has announced an increase of $50 in the annual fee for tuition, to take effect next September. This will raise the total annual charge for board, room and tuition to $800, with a few rooms at a reduced price mak-

ing totals of $750 and $700. A sum has been set aside for additional scholarship aid, so that no students now doing good work in college may be prevented from returning.

The Board of Education of Bridgeport, Connecticut, ordered the schools closed from March 20 until April 2 because of a deficit of $19,000 in the funds for school operations. The order starts the Easter vacation three days ahead of schedule and gives extra vacation to 30,000 pupils.

A recent anti-Jewish outburst by students of New York University, which manifested itself by glaring posters carried on the campus and pasted on windows of the buildings, was quelled soon after university authorities learned of it. According to the Associated Press, the posters bore protests in both English and Yiddish characters. After denouncing the outburst, Dean Archibald L. Bouton, of the College of Arts and Sciences, ordered an investigation of the affair.

The faculty of Brown University has granted the petition of the class of 1923 to relieve deserving members of the class from taking final examinations in June. Seniors having a B average or better will be excused in subjects in which they attained this grade. The faculty action is interesting because similar petitions have been presented annually by graduating classes for thirty years, and in only one case was the petition granted. The exception has been made because never before have so many seniors attained straight A in their courses.

The Highway Education Board, Washington, D. C., has announced the fourth essay contest open to high school students throughout the country in competition for the H. S. Firestone scholarship. This scholarship provides tuition, board, books and special fees at any college or university for four years. The assigned subject of the essays to be submitted is "The influence of highway transport upon the religious life of my community." Essays are due on May 1.

A tenure bill has been introduced in the Ohio Senate by State Senator George H. Bender, of Cleveland. It provides that teachers after a three-year probationary period can not be removed except for inefficiency, neglect of duty, immorality or improper conduct and only after charges have been filed and the accused has been given a hearing before the employing school board.

SPECIAL CORRESPONDENCE

THE CALIFORNIA POLYTECHNIC SCHOOL PLAN OF GUIDANCE

Doctor Rynearson's article entitled "Essentials of a High School Vocational Guidance Program" in School and Society for January 6, 1923, sets forth some ideals to be hoped for, and, if possible, attained in any system of vocational guidance. In the hope of finding a system which might be working with similar ideals but among rural young people, the writer conducted a survey of vocational guidance in the secondary schools of the country districts. The results of the survey were most discouraging. It seemed evident that the rural child, almost universally, was receiving no systematic vocational guidance. Rural high schools very frequently assumed that the rural child had talents for agricultural pursuits only and offered him vocational courses limited to the local type of agriculture. If these did not interest him, he was left to drift unguided and untrained into any "job" or out into city vocations with which he was absolutely unacquainted.

This article is written to describe one secondary school which is functioning to give the rural child his chance, his opportunity to fit himself for the vocation which best suits his abilities. In the California Polytechnic School, under the direction of President Nicholas Ricciardi, almost all the ideals outlined by Doctor Rynearson are being realized.

President Ricciardi has carefully studied the question of vocational guidance and life success and aims through a complete and efficient program to develop in the young people of the Polytechnic those qualities which make for citizenship success as well as vocational success. In a recent pamphlet entitled "Student rating and vocational guidance" he says that a careful study of the lives of successful men discloses that, "Success in any vocation depends fundamentally upon five capacities, namely, mental capacity, physical capacity, moral ca-

pacity, cooperation capacity, and craft capacity." He defines each of these capacities briefly thus:

"Mental capacity, briefly, is the ability to acquire, to coordinate and to apply ideas.

"Physical capacity is the ability to keep in good health and to endure.

"Moral capacity is the ability to discharge obligations in accordance with the generally approved ethical standards.

"Cooperation capacity is the ability to respect the honest convictions of others and to work in harmony with associates and official superiors.

"Craft capacity is the ability to do the kind of work set as the standard of efficiency for the vocation."

In order to develop these various capacities, the program of the Polytechnic is efficiently organized according to the six necessary steps in vocational guidance as outlined by John M. Brewer, of Harvard University, secretary of the National Vocational Guidance Association.

TRY-OUT COURSES

The first year the pupil is given a series of try-out courses. Each unit represents one of the vocations for which training is available at the school. The arrangement and duration of these try-out courses depend upon the individual needs and interests of the pupils. Perhaps it may be necessary for the boy to continue this exploration for the first two years. Perhaps the first or second try-out may open up to the boy his proper field.

It has been found expedient to make the try-out program as flexible as possible in order to meet the various needs of the pupils. If a pupil does not know what he wants, he is started in the line in which his interests seem to lie. If he determines that he doesn't like this course or the vocation for which this course is fundamental, he is shifted to another course or shop. On the other hand, if the pupil has previously determined on a trade, as for instance, auto mechanics, he may not be placed immediately in the auto shop but, rather, in machine shop and forge work, for these two are not only fundamental for auto mechanics but also reveal other vocation possibilities to the lad, and may suggest to him and to his instructor other lines even more in accord with his abilities. All through his try-out experience the boy is carefully observed and directed.

CLASS IN OCCUPATIONS

Jointly with his try-out experience, the pupil is also taking a course in the study of occupations. This course aims to open up to him that wide range of vocations for which he may fit himself and to acquaint him not only with the requirements of each occupation, but also with the social values and the social problems incident to these. An effort is made, particularly, to show the interrelationship and interdependence of all vocations in order to implant within each boy that respect for the "other fellow's" work as well as that sense of social responsibility and cooperation which every worker in the world should have. The boys' reactions to the try-out courses, as well as to the study of occupations, vary according to the degree of work experience which they have had. Those who have already "tried their wings" at some work and have returned to school seem truly grateful and interested. Those who have come from the ranch with a predetermined set of mind toward auto mechanics or horticulture are, at first, almost stubbornly against any digressions from the one line which they wish to pursue even though their abilities in this line may be limited and a wider consideration of all vocations seems advisable.

Relative to predetermined decisions, it has been observed that very often the ranch boy's decision is not based on any analysis whatsoever. He is quite inclined to choose that branch of agriculture or that vocation about which he knows least. The occupations about which he knows most are unattractive because he knows the disadvantages as well as the advantages involved and always the former seem to outweigh the latter. The department of vocation guidance often finds it necessary to turn his decision to that vocation which will fit his natural abilities and offer him possibilities of employment and advancement.

It is interesting to note that the rural boys, as they enter, almost invariably elect to take either mechanical, electrical or academic courses. During their first year they seem to have a decided reaction against agricultural courses. They say, "Oh, I want to learn something new. I know too much about farming now." This

attitude often lasts throughout the four years, but some revert to agriculture in their last year or return for graduate work in this line. Often this new decision in favor of agriculture is the result of a new respect for that vocation which the student has gained by observation of the scientific courses offered by the agricultural department.

COUNSELING

During this time of try-outs, as, indeed, throughout his school life, the boy is carefully and sympathetically guided by his counselor. We quote from the same report: "The success of this program of continuous and organized vocational guidance rests fundamentally upon the right personal relationships established between the students and the instructors. These relationships are developed by the vocational counselors. The entire student body is divided into groups averaging about twenty students, and each group is assigned to a vocational counselor. Every student understands that he can go to his counselor with any problem at any time. If, for instance, a student is in some difficulty in the machine shop, in dairying, in chemistry, or is confronted with any problem whatsoever, he will talk over his trouble with his counselor."

The counselor, if necessary, talks over the matter with the instructor or the chief counselor, and recommends procedure which will eliminate the difficulty. A misunderstanding is cleared away, a new schedule more in line with the pupil's abilities may be recommended, or whatever seems expedient in the interests of the pupil. The most friendly relationships exist between the pupils and the counselors. At first, indeed, the writer was a bit shocked at the friendly familiarity with which the pupils talked with their teachers. But it was soon discovered that in this natural at-home attitude manifested by all, lay the secret of that actual understanding of each of his students which the counselors seemed to have.

The general composition of the student body, as well as its spirit or morale, is a great asset to the school. Here mingle rich and poor, rancher or city man's son, future farmer, mechanic or office clerk, in one big brotherhood, and apparently they accept the faculty as big brothers and sisters, too. Here is the boy of fifteen or of nineteen as a freshman. Here, too, may be those of twenty-two or twenty-three. There are some who have already had some high school work, and some, a very few, who may not be elementary graduates. These latter, however, must be at least fifteen years of age and of a definite mental ability. "Forty-two per cent. of the students have had training ranging from one-half year in high school to high school graduation. Twenty-six per cent. have been at work before enrolling from six months to a year and many have had three or more years' working experience. The students come from sixty-seven different cities and towns in California and from other parts of the United States."

The wide difference in ages and experience among the pupils do not act as a handicap in class or shop work because small classes are maintained. The school does not approve of classes which exceed twenty-five in number, and shop classes usually do not exceed fifteen, so that personal attention to the pupils' problems may be given by each instructor. Very often the presence of the older pupils in the classes serves to give younger members a more workmanlike attitude, while it also acts as an incentive to the instructor to keep ahead of and surely meet the needs of these adult minds. No factory-like sameness in method of pupil product is here possible. The individual is always considered.

MENTAL TESTS

Mental tests are given as an entrance requirement to those pupils who are not elementary school graduates, and thereafter, from time to time, to pupils who present special problems. These are always given either privately or in very small groups and "the information regarding each counselor's group is carefully tabulated and given to the counselor as an aid in counseling." The results, however, are never given to the pupils. The counselors realize the limitations of mental tests as measures of ability or as factors in guidance. If, however, the results confirm the conclusions of the students' instructors, the tests are so used to help determine any final action in regard to the students.

The counselors meet frequently to discuss

common problems and to determine policies or topics which should be discussed with the student body. Each counselor, thereafter, meets his group of students and a frank discussion of these topics is held. Questions relative to the "money value of an education," "characteristics which make for success," "social problems of general student conduct," etc., are among the topics discussed.

VOCATIONAL EDUCATION

The vocational education program is planned to develop craft skill and a knowledge of its underlying theories as well as the social understanding which each vocation demands. The shop equipment of the school is exceptionally good. The mechanics department is offering the boys training in all the trades included in the field of mechanics, electricity, steam engineering, forge, carpentry, etc. The agricultural department uses a four hundred fifty acre farm as its work shop and offers courses in dairying, creamery operation, animal husbandry, horticulture, agronomy, poultry, etc. Recently a print shop with eight complete modern linotype machines has been installed.

All pupils are given an opportunity to prepare to meet college entrance requirements along with their vocational or trade training. This is in order that those who desire to take a professional course may be able to do so, even if for economic reasons they may find it advisable to use their trade as a means to this end. The students who do this must often carry a very crowded program or extend their school days beyond the usual four years.

RELATED WORK

The school aims to give the students enough well-selected related work to make it possible for them to grasp the theories involved in their vocations and so be able to advance much more rapidly than the apprentice workman. Therefore, all students are required to carry a certain number of academic subjects, *i. e.* algebra, general science, chemistry, physics, English, occupations, etc. It is surprising to note with what interest many of the boys go into these courses, particularly after the first year. There is evidently something about the shop work which leads the boys to desire mental exertion and they begin to take a keen delight in the arguments and discussions of the abstract theories involved in the academic studies. The boys express themselves as desiring that type of English which leads to the study of literature rather than shop English. The writer has never found, in any academic high school, the interest in Shakespeare's plays, in Dumas, Victor Hugo, Dickens, etc., which is found among these boys.

STUDENT RATING

A word should be said about student rating and vocational guidance. The procedure in this regard which assures continuous and organized vocational guidance and makes possible adjustments to meet abilities is as follows: "The instructor is responsible for two kinds of rating: Subjective and Objective." The student's rating in Effort is Subjective, his rating in Accomplishment is Objective. His effort rating represents the instructor's estimate of the student's attitude toward his work. It is "Decidedly Satisfactory" when his daily effort is constantly up to his maximum capacity, "Satisfactory" when creditable, "Passable" when his effort is ordinary, "Unsatisfactory" if below average but evident, and "Decidedly Unsatisfactory" if negligible. His "Accomplishment" is rated similarly. It is interesting to note that no pupil is ever permitted to drop a subject when his rating in "effort" is less than "Satisfactory."

In addition to these ratings in terms of effort and accomplishment, the student is also rated in terms of fundamental character qualities—"punctuality," "thoroughness," "ability to overcome difficulties," "social conduct" and "leadership."

SOCIAL PROGRAM

In addition to the regular study program, a social program makes possible that further development of character necessary to create moral and cooperative capacities. The pupils have a Student Affairs Council. This has charge of the athletic association activities, of student publications including a weekly or bi-weekly paper and a school annual, and of the cooperative store. There are also class councils, orchestra, band and glee clubs, mechanics and agricultural clubs, excellent sport activities and a military organization such that the officers,

who are always upper classmen, may assist as social conduct advisers to the privates under them.

Those boys who live in the dormitory are under the personal supervision of the captain who is in every way a big brother to the boys as well as their superior officer. Of late, a special program of social good times has been started for these boys in order to constructively build in them reactions in favor of really good times in contrast to the commercialized recreation offered by the town.

PLACEMENT

Recently, through cooperation with the United States Junior Employment Service, a placement bureau has been started. Boys are assisted in finding remunerative employment while in school and it is hoped, by establishing effective relationships with employers, to place every student successfully in a position for the vacations and at graduation. The director of this placement bureau is a member of the local Chamber of Commerce and is in touch with the business men and openings in the town. An acquaintance with the industries and opportunities in the state is also being established, and points of contact made. The director is the instructor in occupations and is also active in the social activities program of the school, and thus learns to know the boys. By frequent conferences with their counselors and instructors, she becomes acquainted with their abilities and limitations.

A follow-up of those who go out to work is made. Both boy and employer are interviewed in order to determine if the placement has been wisely made or if readjustments are necessary.

California Polytechnic School graduates are succeeding in the tasks they undertake. A student has recently returned to this county as agricultural adviser. The employer of a graduate says: "We wish we had more men like (him) associated with us in our work." He is earning $10,000 a year.

Those who are interested in vocational education and guidance, and who may be expecting to attend the National Education Association Convention in Oakland will find the trip down to the California Polytechnic School at San Luis Obispo an interesting and profitable as well as a scenic side trip to include in their plans.

ELIZA R. PENDRY

DISCUSSION AND CORRESPONDENCE

THE DOING-SCHOOL IN GERMANY

ARTICLES 142-150 of the new German constitution bear the title "Bildung und Schule." Unless we err in our judgment the seed of a new, reconstructed and reformed German educational system is contained in these articles. Undoubtedly they represent a step forward. Through these articles, and through the various educational laws (some of which are still to be enacted) the relationship between the various German states and the central government in matters educational becomes much closer than it has been heretofore. The German government, in fact, seems to have entered upon an active educational campaign. The various political parties of Germany are in accord in their belief that the preservation of the state lies in the strength of its educational plan. No writer, however, would contend that these same parties are agreed upon the method of procedure of such a campaign.

One of the most significant articles of the new constitution is probably the one which makes some form of "Arbeitsunterricht" (learning by doing) an obligatory form of instruction in all German schools. (Art. 148).

The ancient Greeks and Romans, the Realists of the seventeenth century, Pestalozzi, Froebel, our own Dewey and countless others have advocated learning by doing in one form or another. Though our schools may hardly be said to be genuine doing-schools in the true sense of the word, we hardly question the value of learning by doing as an educational principle. Hence we should hardly think it an extraordinary thing to find such an article in the German constitution.

Still there arises the question, "What is meant by Arbeitsunterricht—or as we shall arbitrarily call it, learning by doing?" And it is precisely this question which is perplexing not only German educators but also German political leaders. Strange phenomenon though it may seem, it is nevertheless true to say that German political parties are concerning them-

selves with the interpretation of an important educational problem. This constitutional ambiguity, though not at all unique, creates serious difficulty. For without a proper comprehension of the meaning of this article any practical educational application is impossible.

That the various political parties differ in their interpretation of this article is easily gathered from only a slight perusal of some of the characteristic statements of their leaders.

The Center Party is convinced that this article has but one object, *viz.*, instruction which will teach the significance and the dignity of work. Children should be impregnated with a love for work so that they may become useful citizens of society. Our conception of work is to be elevated and so dignified that the laborer, the farmer, the miner and the many others who earn their daily bread by the toil of their hands are to be an example worthy of emulation by our youth. According to this interpretation of the constitution the school is to give instruction especially in manual work. In other words learning by doing seems to be purely manual in significance. By being occupied with work children are to learn the value of physical activity.

It seems but fair to ask whether the old schools of Germany, especially the Volksschule, ever failed to preach the gospel of the sanctity of work. Certainly idleness and laziness were never encouraged. Manual and physical activity perhaps did not receive the same stress that they do to-day, but still was there ever a school in Germany which did not attempt to inculcate a love for work in the child?

Precisely this point of view was put forth in Saxony, in March, 1920, when it was stated that no good teacher ever lived who crammed his pupils with material without requiring mental or physical reaction on their part.

The socialistic interpretation of learning by doing is the establishment of a school which shall be a miniature state closely connected with all the organs of society. Just as the family of yore was a most important educational influence in that the home was not merely a home but a place throbbing with social and vocational activity, so the school should now be. The school should unite social and practical industrial life in all possible phases. Financial conditions and industrial need, the Socialists maintain, will force Germany eventually to accept this program.

The ambiguity of the constitution has led to a veritable labyrinth of conflicting opinions. Probably no other educational question is being more discussed in Germany to-day than this matter of learning by doing. Educators are generally agreed that the Arbeitsschule must remain, but when it comes to determining the exact nature of the school, opinions are as far apart as the earth's two poles. Kerschensteiner, of Munich, defines the doing-school as being that school which through its methods and through its entire form of organization liberates "the potential mental energy" of the child. The Arbeitsschule should develop useful citizens, first by guiding the child to its proper vocation; second, by instilling in him the idea that each vocation has its place in serving society as a whole; third, by teaching the child the idea that through his vocation he is to contribute his share in helping the state to develop in the direction of an ideal, moral community. Another prominent protagonist of the Arbeitsschule idea is Hugo Gaudig, who demands, as a result of learning by doing not so much citizenship as personality. He is concerned more directly with the pupil than with the state. Gaudig makes the plea that learning by doing should not be restricted to physical activity, but should include mental self-activity as well. Calling the doing-school a "Tatschule," W. A. Lay, the well-known German experimental educator, demands that education should be based upon the biological and psychological unity of observation, mental assimilation and expression.

These are but a few names. Hertel, Seidel, Gansberg, Sharrelmann, Sherer might also be mentioned as being prominent advocates of the Arbeitsschule. But after all these are but names. Nearly every German educator has his pet idea as to what the doing-school should be, and surely the article which makes learning by doing compulsory is elastic enough to allow of very wide interpretation. All these educators emphasize self-activity. Their interpretations differ not so much in the degree as in the kind of self-activity desired. Whether such activity is to be purely mental, or manual, or whether it is to be a combination of both, has not as yet been decided.

One of the most recent political attempts to clarify the situation is that of Minister of Public Education Haenisch, who, in his decree of March, 1921, attempts to give some guidance in the formation of curricula for the newly-established Grundschule (a school which all German children are to attend for the first four years of their education).

Minister Haenisch demands that the child should learn by experiencing things from within. A merely external acquisition of knowledge and ability is not desirable if there is no inner reaction on the part of the child. All instruction should emphasize and foster the relationship existing between the child and its home environment. The education which the child already possesses when it enters school is to be tied up with the new education which it is to receive. Self-activity—mental as well as physical—is to be emphasized on all occasions. Play, observation of nature, manual training, are especially to be utilized in furthering the child's self-activity and self-development.

That these principles are not new goes without saying. Whether we agree with them or not, or whether they clarify the German educational situation with any degree of finality is of no importance. The fact remains that they are probably the first national law that definitely and clearly puts the doing-school upon an obligatory, national basis. Some countries previously had made legal provision for manual training. Still, *manual training*, as can be deduced from what has been stated, is but one phase of *learning by doing*. The former may be an important part of the latter, yet it is never more than a part.

As great as the diversity of opinion concerning the Arbeitsschule may be, it is nevertheless important to note that the greater part of criticism is directed not so much against the fundamental principle of learning by doing as against the method of carrying it out. To be sure many external readjustments and improvements will have to be made. Yet is it not fair to assume that time, the great healer of so many evils, will take care of these? Regardless of our own conception of the principle of learning by doing, one thing seems almost a certainty, namely, that the school of the future, perhaps not only in Germany but throughout the world, will be a doing-school in the sense that mental and physical self-activity of the child will be its most important characteristic.

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AN ENGLISH PLEA FOR BETTER EDUCATION

AN Englishman, writing in a recent number of *The Saturday Review* (London), presents some views which are hardly less applicable to the United States than to England. After deprecating the great "volume of talk" on education and the "eternal education conferences," he says:

> The public must, as a condition precedent of success in any educational policy, put a new value on the teacher as a factor in the community. We may think what we like of the teachers as they are; that is quite a different question. But we *must* learn that the teachers' work is as high as any department of national life and higher than most departments; and that a good teacher is cheap at any price. Both the spiritual and economic assessment of the teacher wants revising. . . . All education in the long run hangs on the teacher, and that is the best teacher who is the best man and the best woman all round. Technical skill in teaching is nothing compared with the personality of the teacher. In education this is the very beginning of wisdom.
>
> Can not the country meet the issue and say we will have either a good education or none at all? Can it not also look facts in the face and admit that a good education can not be had without paying the full price: it can not be had cheap! Can we afford to give the children a good education? If we can not, let us like men face the consequences and scrap the schools. That at least would be honest. It would be better than pretending to give a good education and refusing to give enough money to do it on. But this is what is going on now. . . . The policy of a good education or none would appeal to the people, if firmly and plainly put before them. They would understand it and respect it. But no [English] government has the courage and the honesty to put the educational question that way. All prefer a miserable and dishonest compromise by which we spend a great deal of money with very little to show for it.

I yield to the temptation of excerpting the two propositions which seem to represent the

kernel of the writer's views; to repeat these will at the same time serve to emphasize them:

Technical skill in teaching is nothing compared with the personality of the teacher.

A good teacher is cheap at any price.

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QUOTATIONS

AFTER-EDUCATION FOR ALUMNI

A RECENT issue of SCHOOL AND SOCIETY, *that stimulating and wide-ranging weekly journal of educational thought and action,* contains the following item: "A unique reading and study plan has been offered to the 5,500 alumni of Amherst College. The college proposes, through its faculty, 'to offer guidance to, and to promote conferences for, its alumni and their friends, in order that those who wish to employ their leisure time after graduation in serious and orderly study in subjects of particular interest to them may have the opportunity'."

Although the proposal of after-education for alumni is not unprecedented, we know of no plan for such work which has been brought to the stage of continuous and successful operation. The *Bulletin,* without design to make itself a channel for systematic instruction to alumni, has printed occasional lectures by members of the Harvard faculties. The *Princeton Alumni Weekly* started a year or two ago to issue certain college lectures for distribution among graduates, but the Princeton plan contemplated no enrollment of students, no conferences and no continued guidance in reading. The Amherst scheme is more ambitious. Apparently it involves instruction, at least to the extent of guidance in reading, by correspondence and by conferences at stated intervals. That is very different from the sporadic publication of lectures, and if it works out well it will be indeed unique.

The difficulties in such a scheme are obvious enough. How many alumni have leisure for "serious and orderly study" except on the lines of some special interest, which is likely to be very practical and which may so shape itself as to be remote from the interest of the college professor? Can the professors take on a new burden, which may demand the reorganization of their materials, or researches in special directions, without serious detriment to their teaching and productive study?

In spite of these and other doubting questions, the Amherst plan may realize certain promises in the very idea of university study which have never been fully realized before. It may keep alive the desire for study after graduation and it may keep collegiate teaching and research in closer touch with common needs. If in these two respects it draws the college and its alumni into closer touch, the effort to maintain it will be justified. As in such enterprises generally, the chief problem will doubtless be the problem of organizing the machinery for making the scheme work effectively and without undue sacrifice to other and more immediate concerns. If Amherst can show the other colleges how to do it, Amherst will have done a piece of valuable pioneering. —*The Harvard Alumni Bulletin.*

EDUCATIONAL RESEARCH AND STATISTICS

LEADING AS RELATED TO READABILITY IN THE FIRST FOUR GRADES

THE reading specimens used in this study were prepared with the following leadings[1]: second, third and fourth grades 1.00 mm.,

[1] By the term "leading" is meant space between any two consecutive lines as measured by the vertical distance between the base of a descender as the letter "p" in an upper line and the top of an ascender as the letter "d" in the line just below. Due to the fact that the amount of the type body extending beyond the letter form varies with the size and style of the type used, the term "points of leading," which has reference to a thin strip of lead used to separate the lines of type, is meaningless when considered independently of any given specimen. Hence, the term "millimeters of leading" is preferable to the term "points of leading" and is used by investigators in the hygiene of reading. A confusion, however, may arise when speaking of leading of one millimeter or less, for this is usually solid type, the space between the lines being produced by the bodies of the letter forms, no leads being used. We here use the term "leading" to designate all vertical space between any two consecutive lines whether produced by the type bodies alone or contributed to by the use of strips of lead.

THIRD AND FOURTH GRADES
LEADING
80 Children—320 Readings
TIME IN SECONDS CONSUMED IN READING

	Specimen 1	Specimen 2	Specimen 3	Specimen 4
Amount of leading in terms of points and millimeters	Solid 1 mm.	1 point 1.33 mm.	2 points 1.66 mm.	3 points 2.00 mm.
Arithmetic mean of reading time in seconds	63.23	63.50	63.95	63.51
Standard deviation from arithmetic mean of reading time	2.51	2.58	2.23	2.29
NUMBER OF ERRORS MADE IN READING				
Arithmetic mean of the errors	3.86	3.48	3.84	4.20
Standard deviation from arithmetic mean of the errors	3.38	3.40	3.35	3.23

SECOND GRADE
LEADING
36 Children—180 Readings
TIME IN SECONDS CONSUMED IN READING

	Specimen 1	Specimen 2	Specimen 3	Specimen 4
Amount of leading in terms of points and millimeters	Solid 1 mm.	1 point 1.33 mm.	2 point 1.66 mm.	3 point 2.00 mm.
Arithmetic mean of reading time in seconds	92.76	90.78	92.00	94.46
Standard deviation from arithmetic mean of reading time	5.79	5.92	5.37	5.61
NUMBER OF ERRORS MADE IN READING				
Arithmetic mean of the errors	4.70	4.08	4.12	3.96
Standard deviation from arithmetic mean of the errors	4.23	2.82	2.22	2.56

FIRST GRADE
LEADING
36 Children—108 Readings
TIME IN SECONDS CONSUMED IN READING

	Specimen 1	Specimen 2	Specimen 3
Amount of leading in terms of points and millimeters	Solid .50 mm.	4 points 1.80 mm.	10 points 3.80 mm.
Arithmetic mean of reading time in seconds	66.00	65.61	62.83
Standard deviation from arithmetic mean of reading time	3.56	3.39	3.42
NUMBER OF ERRORS MADE IN READING			
Arithmetic mean of the errors	3.08	3.44	3.10
Standard deviation from arithmetic mean of the errors	2.54	2.23	2.19

1.33 mm., 1.66 mm. and 2.00 mm.; first grade .50 mm., 1.80 mm. and 3.80 mm. All other factors which might function in determining the facility with which a given specimen may be read, such as size of type, length of line, regularity of margin, illumination, chance disturbances in reader's environment, learning as the child reads through the specimens, etc., were controlled through the printing of the material or the operation of the laws of chance. The reader will find a complete discussion of the technique used in "Size of type as related to readability in the first four grades," SCHOOL AND SOCIETY, Volume XVI, 697-700.

The table representing the third and fourth grades shows that in this experiment two millimeters of leading has no advantage over one. In the second grade there seems to be a slight advantage in the use of 1.33 millimeters of leading. The table representing the first grade indicates that more leading is necessary. Here 3.80 millimeters seems to be preferable to .50 or 1.80 millimeters. However, there seems to be no difference in the readability of matter containing .50 and 1.80 millimeters of leading.

On the basis of this study the writer would recommend about 4.00 millimeters of leading in the beginning of the first grade with a gradual reduction to about 1.33 millimeters as the material approached in difficulty that appropriate for the second grade. One millimeter of leading, solid type, separates the lines sufficiently for grades above the second.

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